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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/708,797	11/07/2000	Andreas Schilling	18235-04726	2506

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EXAMINER	
HAVAN, THU THAO	
ART UNIT	**PAPER NUMBER**
2672	15

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Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

Office Action Summary	**Application No.** 09/708,797	**Applicant(s)** SCHILLING ET AL.	
	Examiner Thu-Thao Havan	**Art Unit** 2672	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *11 February 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *58-77* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *58-77* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *13*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

Claims **58-77** are pending in the present application.

Applicant's arguments filed February 11, 2004 have been fully considered but they are not persuasive. As addressed below, Kelley, Williams, and Cosman teach the claimed limitations.

Kelley discloses geometric shape when he teaches a graphical image (col. 1, lines 15-42; fig. 1). A graphical image comprises of many geometric shapes or one geometric shape depends on the user. In that he discloses a display device capable of displaying color graphics images. A complication with the use of texture maps is encountered when a graphical system provides for the zooming of images. A zoom operation requires a filtering operation be performed on the values from the texture map in order to obtain an acceptable image. Here, filtering involves the averaging of corresponding pixel values. For example, if the graphical image is to be reduced in size by 4, one pixel in the display would now correspond to 4 pixels in the texture map. The value for the one pixel would be the average of the 4 corresponding pixels. Performing such averaging "on the fly" can be detrimental to rendering speed. In addition, Williams teaches a texture map (page 2). He discloses a texture map for mip mapping. Mip mapping supplements bilinear interpolation of pixel values in the texture map.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claim **58-66, 71-73, and 77** are rejected under 35 U.S.C. 103(a) as being unpatentable over Kelley et al. (US Patent No. 5,606,650) in view of non-patent literature, Williams, L., "Pyramidal Parametrics", (hereinafter as Williams).

Re claim **58**, Kelley discloses a method for mapping a texture onto a surface (<u>col. 1, lines 16-19</u>) of a computer generated object comprising the steps of texturing operations being determined by a geometric shape of a projection of a pixel on the texture (<u>col. 1, lines 24-42</u>); and averaging results of texturing operations (<u>col. 1, lines 36-63</u>). In other words, Kelley teaches texture mapping involves mapping predetermined pixel shading values (the texture map) to a surface being rendered. The texture map is typically stored in a random access storage means that is accused by the graphical system during the rendering of a graphical image. This arrangement allows for utilizing different texture maps. In that Kelley teaches a zoom operation requires a filtering operation be performed on the values from the texture map in order to obtain an acceptable image. The filtering involves the averaging of corresponding pixel values. For example, if the graphical image is to be reduced in size by 4, one pixel in the display would now correspond to 4 pixels in the texture map. The value for the one pixel would be the average of the 4 corresponding pixels.

However, Kelley *fails* to specifically disclose approximating a true pixel color by performing a number of texturing operations. On the other hand, Williams discloses approximating a true pixel color by performing a number of texturing operations (pages 1-3; fig. 1). In other words, Williams teaches texture mapping of images onto surfaces to increase the realism and information content of computer-generated imagery. For example, he teaches the projection of a flat surface image onto a curved surface. The image is separated into its red, green, and blue component. Thus, a true pixel color is generated with his parametric interpolation. Furthermore, Williams teaches interpolation between the original samples of the source image is necessary and as the scale is reduced, approximation of multiple samples in the source is required. The projection of a pixel on the texture is formatted by parametric interpolation. Mip mapping is a particular format for parametric functions, which has been used to bandlimit texture mapping. Mip mapping supplements bilinear interpolation of pixel values in the texture map which may be used to smoothly translate and magnify the texture with interpolation between prefiltered versions of the map which may be used to compress many pixels into a small place. Thus, it would have been obvious for one of ordinary skill in the art to combine approximating a true pixel color by performing a number of texturing operations of Williams to the system of Kelley because it would have enable the memory organization of a color mip map with the image separated into red, green, and blue components (Williams: pages 1-3; fig. 1).

Re claim **59**, Williams teaches accessing a mipmap at least one time and responding to multiple accesses being performed by, interpolating results of the

accesses (page 2). In other words, parametric interpolation of Williams addresses this claimed limitations.

Re claim **60**, Williams teaches texturing operations is a power of two (page 2, 5th paragraph; page 3, 2nd paragraph). Williams teaches the samplings are performed at scales, which are powers of two.

Re claim **61**, Williams teaches texturing operations is less than or equal to a predetermined limit (page 2; fig. 1). In figure 1, Williams teaches the structure of a color mipmap wherein each of the images is averaged down from its larger predecessor.

Re claim **62**, Williams teaches texture represents a reflected environment (page 7, 3rd paragraph; figs. 13-14). In other words, Williams teaches the shading function depends not only the shape of the surface, but its light reflection properties.

Re claims **63-66 and 72**, Williams teaches modifying a specularly reflected light intensity on a surface of a computer generated object (page 7, 3rd paragraph; figs. 13-14), comprising combining the specularly reflected light intensity with a specular reflectance coefficient, specular reflectance coefficient being retrieved from a specular reflectance coefficient map associated with the surface (pages 7-8).

Re claim **71**, the limitations of claim 71 are identical to claim 58 above except for an electronically-readable medium storing a program for permitting a computer to perform. Therefore, claim 71 is treated the same as discussed with respect to claim 58 above. Williams' teaching is a computer software system with image storage and transmission may permit significant compression of the data to be stored or transmitted (page 1). It is apparent that a program is stored on an electronically-readable medium.

Re claim **73**, Williams teaches an electronically-readable medium storing a program for permitting computer to perform a method for adding detail to a texture map comprising at least one texture element, the method comprising generating a detail map (page 9); assigning a pointer (page 2; index correspond to pointer) into detail map to at least one of the texture elements of the texture map to generate a pointer map, pointer comprising two offsets including a first offset stored in a first offset map and a second offset stored in a second offset map (pages 2-3); interpolating detail color based on the generated detail map (page 3); interpolating texture color based on the texture map; and combining detail color with texture color to generate a pixel color (pages 3 and 7-8).

Re claim **77**, Cosman teaches geometric shape of the projection of the pixel on the texture is a parallelogram comprising a larger side and a smaller side and wherein approximating the projection of the pixel further comprises generating coordinates for each texel based on a direction along the larger side of the parallelogram (fig. 1).

Claim **67-70 and 74-76** are rejected under 35 U.S.C. 103(a) as being unpatentable over Kelley et al. (US Patent No. 5,606,650) in view of non-patent literature, Williams, L., "Pyramidal Parametrics", (hereinafter as Williams) and further in view of Cosman (US patent 5,651,104).

Re claim **67**, the limitations of claim 67 are identical to claim 58 above except for the specific limitations as addressed below. Therefore, claim 67 is treated the same as discussed with respect to claim 58 above. On a further note, Williams teaches mipmap comprises a plurality of levels, each of which levels comprises at least one texel (pages

1-3), the texturing unit comprising a control unit for receiving an input signal and determining a set of N footprint texel locations and at least one footprint level of detail from the input signal, which input signal includes information about a location and a shape of a projection of a pixel on the texture (pages 8-9—levels of detail in surface representation and dividing the surface up into regions of relatively low curvature of Williams discloses this limitation); an interpolator (page 2- parametric interpolation of Williams addresses this); and an averaging unit (page 2; fig. 1-- each of the images is averaged down from its larger predecessor).

Kelley and Williams *fail* to specifically disclose a Random Access Memory (RAM) and an output port. However, Cosman teaches a Random Access Memory (RAM) in a computer graphics system using supersampling of multi-level pixel characteristic data (col. 9, lines 10-50). As for an output port, Cosman teaches a display unit. A display unit is a type of output port because it output information for the users. It would have been obvious for one of ordinary skill in the art to combine a Random Access Memory (RAM) and an output port of Cosman to the system of Kelley and Williams because it would have enable an image generator to store texture mapping information in a RAM and output the information in a display unit (Cosman col. 9, lines 10-50).

Re claims **68-69**, these limitations are being treated with the same grounds of rejection as claim 67 above.

Re claim **70**, Williams teaches mipmap generation unit calculates each level of the generated mipmap incrementally based on available information from the next level of higher detail (pages 2 and 8-9; figs. 1 and 20-23). In figures 1 and 20-23, Williams

teaches mipmap generation wherein the interpolation of each images is averaged down from its larger predecessor.

Re claim **74**, Cosman teaches approximating the projection of the pixel on the texture by a footprint assembly (fig. 5). In figure 5, Cosman discloses footprint calculation (element 70).

Re claim **75**, Cosman teaches footprint assembly comprises a plurality of texels (col. 6, lines 36-45). Cosman discloses the footprint in texels which corresponds to footprint assembly comprises a plurality of texels.

Re claim **76**, Cosman teaches each texel is a square mipmapped texel (figs. 1-3).

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Inquiries

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thu-Thao Havan whose telephone number is (703) 308-7062. The examiner can normally be reached on Monday to Thursday from 9:00-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Razavi can be reached on (703) 305-4713.

Any response to this action should be mailed to:

Commissioner of Patents and Trademarks

Washington, D.C. 20231

or faxed to:

(703) 872-9314 (for Technology Center 2600 only)

Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive, Arlington, VA, Sixth Floor (Receptionist).

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Technology Center 2600 Customer Service Office whose telephone number is (703) 306-0377.

Thu-Thao Havan
April 13, 2004

MICHAEL RAZAVI
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600